

**Session title:** G01c - Reference Systems and Frames

**Session type:** IAG (Geodesy)

**Symposium:** G01

**Presentation number:** IUGG19-2788

### ★ Abstract title:

First results of the GEODESIE project towards the GGOS objectives for geodetic references.

S. Nahmani<sup>1</sup>, D. Coulot<sup>2,3,4</sup>, R. Biancale<sup>5</sup>, T. team of the french "ANR-GEODESIE" project<sup>6</sup>.

<sup>1</sup>IPGP- IGN- Université Paris Diderot- Sorbonne Paris Cité- CNRS UMR 7154- GRGS, Equipe de Géodésie, Paris Cedex, France.

<sup>2</sup>IPGP- IGN Université Paris Diderot- Sorbonne Paris Cité- CNRS UMR 7154, Equipe de Géodésie, Paris Cedex, France.

<sup>3</sup>ENSG-IGN, Centre de Compétences Géodésie et Métrologie Dimensionnelle, Champs-sur-Marne, France.

<sup>4</sup>Observatoire de Paris- PSL Research University- CNRS UMR 8028- GRGS, IMCCE- Institut de mécanique céleste et de calcul des éphémérides, Paris, France.

<sup>5</sup>GFZ German Research Centre for Geosciences, Geodesy, Potsdam, Germany.

<sup>6</sup>GRGS, Geodesy- <https://geodesie-anr.ign.fr/>, Paris, France.

Many major indicators of climate change are monitored with space observations (sea level rise from satellite altimetry, ice melting from dedicated satellites, etc.). This monitoring is highly dependent on geodetic references. The current accuracy of these references does not permit to fully support the challenges that the constantly evolving Earth system gives rise to, and can consequently limit the accuracy of these indicators. For this reason, in the framework of the Global Geodetic Observing System (GGOS), stringent requirements are fixed to the International Terrestrial Reference Frame (ITRF) for the future: an accuracy at the level of 1 mm and a stability at the level of 0.1 mm/yr. This means an improvement of the current accuracy of ITRF by a factor of 5-10.

Improving the quality of the geodetic references is an issue which requires a thorough reassessment of the methodologies involved. The GEODESIE (GEOdetic Data assimilation and ESTimation of references for climate change InvEstigation, [geodesie-anr.ign.fr](http://geodesie-anr.ign.fr)) project, funded by the French Agence Nationale de la Recherche (ANR) for the period 2017-2020, aims at improving this quality, with a beyond state-of-the-art space-geodetic data assimilation. As a mid-term review, we provide an overview of some of the results obtained, with a particular focus on the improvement of the accuracy of the Terrestrial Reference Frame that could be reached with the possible future geodetic observatory of Tahiti (Papeete, French Polynesia).